

Claims

1. (Currently amended) A process for melting materials to be treated, the process comprising:

placing hazardous and/or contaminated and/or waste materials to be treated into a container, wherein the container does not comprise a region formed in the ground;

heating the hazardous and/or contaminated and/or waste materials to be treated in the container at a temperature of at least about 1400 degrees C until the materials to be treated melt to create melted hazardous and/or contaminated and/or waste materials; and

allowing the melted hazardous and/or contaminated and/or waste materials to cool in the container to create a vitrified hazardous and/or contaminated and/or waste material.

2. (Previously presented) The process of claim 1 further comprising the step of disposing of the container with the vitrified hazardous and/or contaminated and/or waste material therein.

3. (Previously presented) The process of claim 2 wherein the hazardous and/or contaminated and/or waste materials are heated at a temperature of from about 1400 to about 2000 degrees C.

4. (Previously presented) The process of claim 1 wherein the hazardous and/or contaminated and/or waste materials are heated to form a molten state without addition of temperature-lowering additives.

5. (Previously presented) The process of claim 4 wherein the container has a structure to collect gases.

6. (Previously presented) The process of claim 4 that further comprises the steps of: removing the gas-collecting structure from the container after the melted material has been allowed to cool; and

disposing of the container that includes the vitrified hazardous and/or contaminated and/or waste material therein.

7. (Previously presented) The process of claim 1 wherein the hazardous and/or contaminated and/or waste material to be treated is heated by at least two removable electrodes located in the material to be treated and passing a current between the at least two removable electrodes.

8. (Previously presented) The process of claim 7 wherein a starter path of material is placed between the at least two removable electrodes prior to the heating the material to be treated.

9. (Previously presented) A process for melting materials having hazardous and/or contaminated substances, comprising:

placing materials including the hazardous and/or contaminated substances into a container that can withstand temperatures of up to 2000 degrees C without significant degradation of the container;

heating the materials in the container to a molten state;

vitrifying the molten materials without removing molten materials from the container to form a vitrified product in the container that contains at least a portion of the hazardous and/or contaminated substances immobilized therein; and

discarding the container with the vitrified product therein or removing the vitrified product from the container.

10. (Previously presented) The process of claim 9 wherein the container further includes a lid or cover and at least one heating device that extends through the lid or cover and into the material to be heated.

11. (Previously presented) The process of claim 9, wherein the material is heated by at least one heating device that is not connected to the container being placed within the material.

12. (Previously presented) The process of claim 9 wherein the material includes a radioactive substance therein.

13. (Previously presented) The process of claim 9 wherein the container is discarded with the vitrified product therein.

14. (Previously presented) The process of claim 9 that further includes removing the vitrified material from the container.

15. (Original) The process of claim 1 wherein the container includes an insulating layer.

16. (Original) The process of claim 15 wherein the insulating layer comprises thermal insulation board.

17. (Original) The process of claim 15 wherein the container further includes a refractory material.

18. (Previously presented) The process of claim 9 wherein the container further includes a refractory material.

19. (Previously presented) The process of claim 9 wherein an additive is added to the material to be treated.

20. (Previously presented) The process of claim 19 wherein the additive increases the electrical conductivity of the material to be treated.

21. (Original) The process of claim 19 wherein the additive aids in oxidizing metals contained in the material to be treated.

22. (Original) The process of claim 19 wherein the additive aids in destroying hazardous materials in the material to be treated.

23. (Previously presented) The process of claim 19 wherein the additive aids in destroying chlorinated organic materials.

24. (Previously presented) The process of claim 19 wherein the additive aids in improving the durability of the vitrified material.

25. (Currently amended) The process of claim 19 further comprising heating the material to a temperature of at least about 1400 degrees C.

26. (Previously presented) The process of claim 1 wherein further material is passively added to the container as the material in the container is being heated.

27. (Previously presented) The process of claim 1 wherein further material is actively added to the container as the material in the container is being heated.

28. (Currently amended) ~~The process of claim 9~~ A process for melting materials having hazardous and/or contaminated substances, comprising:

placing materials including the hazardous and/or contaminated substances into a container that can withstand temperatures of up to 2000 degrees C without significant degradation of the container wherein the container has a cavity and includes a slip form positioned in the cavity;

heating the materials in the container to a molten state;

vitrifying the molten materials without removing molten materials from the container to form a vitrified product in the container that contains at least a portion of the hazardous and/or contaminated substances immobilized therein; and

discarding the container with the vitrified product therein or removing the vitrified product from the container.

29. (Previously presented) The process of claim 28 further including the step of placing sand in the container behind the slip form.

30. (Previously presented) The process of claim 29 further including removing the slip form from the container and leaving the sand.

31. (Original) The process of claim 29 wherein the slip form is not removed from the container.

32. (Currently amended) The process of claim 29 ~~27~~ wherein the container has a plurality of walls and an opening is defined between the plurality of walls and the slip form.

33. (Original) The process of claim 32 that further includes the step of placing sand in the opening.

34. (Currently amended) The process of claim 29 ~~27~~ wherein the container has a plurality of walls and a bottom and a first opening is defined between the plurality of walls and the slip form and a second opening is formed between the bottom and the slip form.

35. (Original) The process of claim 34 that further includes the step of placing sand in both the first opening and the second opening.

36. (Original) The process of claim 1 that further includes the step of placing a liquid impermeable liner in the container, wherein the material to be treated is placed in the liner.

37. (Previously presented) The process of claim 1 wherein the material to be treated is contained in one or more vessels that are placed in the container.

38. (Previously presented) The process of claim 37 wherein there is a plurality of vessels and there are voids between the vessels.

39. (Original) The process of claim 38 wherein soil is placed in the voids.

40. (Previously presented) The process of claim 9 wherein the material to be treated is contained in one or more vessels that are placed in the container.

41. (Currently amended) The process of claim 40 wherein there is a plurality of vessels and there are voids between the ~~boxes~~vessels.

42. (Original) The process of claim 41 wherein soil is placed in the voids.

43. (Currently amended) ~~The process of claim 1~~ A process for melting materials to be treated, the process comprising:

placing hazardous and/or contaminated and/or waste materials to be treated into a container, wherein the container does not comprise a region formed in the ground;

~~that further includes~~ covering the material with soil prior to heating;

heating the hazardous and/or contaminated and/or waste materials to be treated in the container until the materials to be treated melt to create melted hazardous and/or contaminated and/or waste materials; and

allowing the melted hazardous and/or contaminated and/or waste materials to cool in the container to create a vitrified hazardous and/or contaminated and/or waste material.

44. (Original) The process of claim 1 wherein the material to be treated is mixed with soil.

45. (Original) The process of claim 1 wherein the material to be treated is soil material.

46. (Original) The process of claim 1 wherein the material to be treated includes soil material.

47. (Original) The process of claim 1 wherein the material to be treated includes radioactive material.

48. (Original) The process of claim 1 wherein the material to be treated includes hazardous, non-radioactive material.

49. (Original) The process of claim 1 wherein the material to be treated includes one or more of the group consisting of hazardous elemental materials, organic compounds, and inorganic compounds.

50. (Original) The process of claim 1 that further includes the step of capturing gases generated by heating the material to be treated.

51. (Original) The process of claim 50 wherein the captured gases are treated.

52. (Original) The process of claim 1 wherein additional material to be treated are placed in the container.

53. (Original) The process of claim 52, wherein the additional material to be treated is added to the container using an active feeding method.

54. (Original) The process of claim 52, wherein the additional material to be treated is added to the container using a passive feeding method.

Claims 55-68 (Canceled)

69. (New) A process for melting materials having hazardous and/or contaminated substances, comprising:

placing materials including the hazardous and/or contaminated substances into a container;

heating the materials in the container to a molten state without using an additive material to lower the melting point of the material to be treated, and passing a current between the at least two removable electrodes;

vitrifying the molten materials without removing molten materials from the container to form a vitrified product in the container that contains at least a portion of the hazardous and/or contaminated substances immobilized therein; and

discarding the container with the vitrified product therein or removing the vitrified product from the container.

70. (New) A process for melting materials having hazardous and/or contaminated substances, comprising:

placing materials including the hazardous and/or contaminated substances into a container that can withstand temperatures of up to 2000 degrees C without significant degradation of the container;

placing a starter path of material between at least two electrodes located in the material to be treated and passing a current between the at least two electrodes to heat the materials in the container to a molten state;

vitrifying the molten materials without removing molten materials from the container to form a vitrified product in the container that contains at least a portion of the hazardous and/or contaminated substances immobilized therein; and

discarding the container with the vitrified product therein or removing the vitrified product from the container.